

forestry, and the professor and students have the advantage of a forest nursery located in Earl Bathurst's park, a portion of which he placed at the disposal of the college for this purpose.

THE Board of Education has published (Cd. 4037) the Regulations for English Secondary Schools for the year beginning August 1 next. The regulations are in main substance the same as those of last year. Owing to difficulties which have arisen during the past year in the interpretation of the regulations referring to the provision of free places in secondary schools, these rules have been further defined. It is made clear that boys and girls applying for such free places may be required to pass an entrance test of attainments and proficiency, having due regard to the age of the applicants, the subjects in which they have been receiving instruction, and the standard of attainments and proficiency required for the admission of fee-paying pupils. Pupils who enter the school as bursars or pupil teachers must not be counted in estimating the number of free places provided. In examinations held for the selection of boys and girls to occupy free places, importance is to be attached to the report of the candidate's own teachers, and the masters or mistresses of the secondary school are to be associated with teachers familiar with elementary-school conditions in conducting the examination. The regulations make provision, too, for greater elasticity in the way of adapting the instruction to the requirements of the pupil, though precautions are taken to see that this privilege is used with proper moderation. To meet the difficulty of providing secondary education in rural areas and less populous urban or semi-urban districts, the Board is prepared next year to recognise secondary schools with fifteen instead of sixteen as the normal leaving age, but this concession is only made where a consideration of local circumstances shows that it will be of distinct educational advantage to the district, and that a longer school-life is not under actual conditions possible.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 27, 1907.—"On the Polymorphic Changes of Ammonium Nitrate." By **U. Behn**. Communicated by Prof. A. Schuster, F.R.S.

The main results of the research may be summarised as follows:—

(a) From the dilatometric and crystallographic work no definite information is forthcoming which affords any precise proof as to a difference in properties of the two tetragonal modifications of ammonium nitrate.

(b) The argument derived from the investigation of the thermal properties tells, so far as it goes, against the identity of the two tetragonal modifications, but it cannot be considered as decisive.

January 30, 1908.—"The Refractive Index and Dispersion of Light in Argon and Helium." By **W. Burton**. Communicated by Prof. J. J. Thomson, F.R.S.

The initial object of this research was to find the dispersion of light in the monatomic gases argon and helium, but as it was necessary to know the absolute value of the refractive index with considerable accuracy, determinations of the refractive index were made.

The results for argon and helium are tabulated below, and, for comparison, Mascart's values for hydrogen are also given.

Refractive index, reduced to 0° C. and 760 mm. pressure for D₁ line.

Argon	1'0002837
Helium	1'00003500
Hydrogen (Mascart)	1'0001387

Dispersion:—In equation

$$n - 1 = A \left(1 + \frac{b}{\lambda^2} \right), \text{ or } n = A + \frac{B}{\lambda^2},$$

	$\frac{b}{\lambda^2}$	$\frac{A}{\lambda^2}$	$\frac{B}{\lambda^2}$	
Argon ...	$5'6 \times 10^{-11}$	0'0002792	1'0002792	$1'6 \times 10^{-15}$
Helium...	$2'2 \times 10^{-11}$	0'00003478	1'00003478	$7'5 \times 10^{-16}$
Hydrogen (Mascart)	$4'3 \times 10^{-11}$	0'0001376	1'0001376	$5'9 \times 10^{-15}$

It may be noted that the values of a/b for these substances are approximately in the ratio 3:1:2.

February 13.—"The Effect of Hydrogen on the Discharge of Negative Electricity from Hot Platinum." By Prof. H. A. **Wilson**, F.R.S.

The view taken in this paper is that the effect of the hydrogen on the leak is due to its presence in the surface layer of the platinum. To explain this it is supposed that the hydrogen atoms in the layer are positively charged, so that they diminish the charge per unit area in the electrical double layer covering the surface of the platinum. The hydrogen appears to dissolve in the platinum at first, but at high pressures in time forms a stable combination with the platinum, having a very small dissociation pressure. Before this compound has been formed, the leak is proportional to a power of the pressure of the hydrogen.

February 20.—"On the Dispersion of Gaseous Mercury, Sulphur, Phosphorus, and Helium." By **C. Cuthbertson** and **E. Parr Metcalfe**. Communicated by Prof. F. T. Trouton, F.R.S.

In continuation of previous work on the refractive indices of certain elements in the gaseous state, the authors have measured the dispersion of the elements named above within the limits of the visible spectrum.

The results obtained may be summarised as follows:—

Mercury	$\mu - 1 = 0'001755 \left(1 + \frac{2'265}{\lambda^2 10^{10}} \right)$
Sulphur	$\mu - 1 = 0'001046 \left(1 + \frac{2'125}{\lambda^2 10^{10}} \right)$
Phosphorus... ..	$\mu - 1 = 0'001162 \left(1 + \frac{1'53}{\lambda^2 10^{10}} \right)$
Helium	$\mu - 1 = 0'0000347 \left(1 + \frac{2'4}{\lambda^2 10^{11}} \right)$

The dispersion of mercury is about four times that of air.

The index of sulphur for infinite waves is, within 2 per cent., four times that of oxygen. Its dispersion is, not so exactly, four times that of oxygen.

The index of phosphorus, for infinite waves, is exactly four times that of nitrogen. Its dispersion is almost exactly twice that of nitrogen.

The index of helium is, within 1.6 per cent., one-eighth of the best existing value for the index of argon. Its dispersion is about three-sevenths that of air.

March 5.—"On the Electrical Resistance of Moving Matter." By Prof. F. T. **Trouton**, F.R.S., and A. O. **Rankine**.

The question of relative motion between the earth and the neighbouring ether has been under discussion for many years. It has, from time to time, been the subject of important investigations, but these have all resulted negatively. The experiment described in the present paper is not different from them in this respect, yielding, as it does, no definite information on the main point. Indirectly, the aim was to measure the direction and magnitude of ether-drift, the actual method having been to attempt to demonstrate the existence of the Fitzgerald-Lorentz shrinkage, which has been supposed to mask the effect in the direct experiments of Michelson and Morley, and of Trouton and Noble.

The results lead the authors to conclude:—

(1) The total electrical resistance of a wire is not altered by an amount exceeding 5×10^{-10} of the whole amount by any change of its position relative to its motion through space.

(2) On the assumption that the Fitzgerald-Lorentz shrinkage is a real effect, the specific resistance of a material is dependent upon the direction of flow of the current, being greater to a current flowing parallel to the velocity of the material through space than to a current in a perpendicular direction. The magnitude of this change of specific resistance is shown by the experiments to be certainly within 2 per cent. of being sufficient to compensate the change of length.

March 12.—"Bacteria as Agents in the Oxidation of Amorphous Carbon." By Prof. M. C. **Potter**. Communicated by Prof. J. B. Farmer, F.R.S.

Under conditions of exposure to the air, a slow oxidation

of amorphous carbon takes place through the agency of bacteria. This has been conclusively established by experiments upon such carbonaceous substances as charcoal, lamp-black, coal, and peat.

When these substances are subjected to bacterial action carbonic acid is given off, as estimated volumetrically by absorption in baryta solution and titration with standard oxalic and hydrochloric acids.

The amount of CO_2 given off increases in proportion to the rise of temperature, and ceases to be evolved at a supra-vital temperature. There is no evolution of CO_2 under perfectly dry conditions such as preclude the possibility of bacterial life.

A distinct rise of temperature occurs through the action of bacteria. The heat generated was determined by measurement, with a galvanometer, of the electromotive force produced by the difference of temperature between two thermo-elements, one placed in a sterile and the other in an inoculated flask.

The evolution of CO_2 and the accompanying rise of temperature does not take place when carbonaceous substances are preserved from the intrusion of micro-organisms.

The heat generated by microbial activity is an influence to be taken into account in connection with the oxidation and spontaneous combustion of coal; it may be a dangerous motive force acting upon explosive gases.

The oxidising action of bacteria must be largely responsible for the disintegration of coal and the high percentage of depreciation which it undergoes in store.

Coal and peat, like other organic matter, are liable to decomposition as soon as conditions are presented suitable for the life of aerobic organisms. The carbon is then once more liberated in the form of CO_2 to play its rôle in the life-cycle. It is thus conceivable that the vast supplies of carbon locked up in the world's coalfields may become available for plant nutrition without the intervention of direct combustion.

"The Origin and Destiny of Cholesterol in the Animal Organism," parts i. and ii. By C. **Dorée** and J. A. **Gardner**. Communicated by Dr. A. D. Waller, F.R.S.

These two papers throw some further light on the interesting question of the part played by cholesterol in the economy. The authors made, first, a very thorough and careful examination of the excretion of cholesterol by the dog. The animal was fed for periods varying between fourteen and thirty days on diets the cholesterol content of which varied greatly. The output of cholesterol in the faeces was in every case found to be a function of the food taken. Thus in seventeen days on horseflesh one gram of cholesterol was recovered, in thirty-one days on oatmeal and water 0.1 gram only. On a diet of raw brain, which is rich in cholesterol, a very interesting result was observed. In fourteen days the output amounted to 17 grams, and it consisted entirely of coprosterol, the dihydrocholesterol normally present in human faeces. In every experiment the cholesterol actually found was very much less than the quantity that should have been poured into the intestine with the bile.

In the excrement of grass-fed animals the main cholesterol product is the so-called hippocoprosterol, which is shown to be an alcohol, $\text{C}_{27}\text{H}_{54}\text{O}$, melting at 79°C . But far from being, as previously supposed, reduced from cholesterol in the intestine of the animal, it is merely a constituent of the grass taken as food. This was finally and clearly proved by feeding a rabbit on grass from which the chortosterol (as the authors propose to re-name it) had been removed by extraction with ether. The body could no longer be obtained from the faeces. No trace of cholesterol was found in the excrement of the herbivora examined, and it thus appears probable that the cholesterol of their bile is actually absorbed in the intestine—a point at present under investigation.

April 2.—"The Antagonistic Action of Calcium upon the Inhibitory Effect of Magnesium." By S. J. **Meltzer** and J. **Auer**. Communicated by Prof. E. H. Starling, F.R.S.

In a series of recent studies which the authors have carried out upon the relations of the effects of calcium to magnesium, many facts came to light which demonstrate

unmistakably that calcium is the most available agent to neutralise inhibitory effects of magnesium. The following experiment is an instance:—

By subcutaneous injections of a magnesium salt (for instance, Epsom salt—about 7 c.c. of a 25 per cent. solution per kilogram), rabbits are brought to a profound state of anaesthesia and paralysis. The slow and shallow respirations indicate the approaching danger. Now 6 c.c. or 8 c.c. of an M/6 or an M/8 solution of a calcium salt are given through the ear vein. Within a few seconds the respiration becomes quicker and deeper, and within one minute the animal turns over, sits up, and appears normal.

Here calcium not only did not add an inhibitory effect, but completely neutralised the profound inhibitory effect of magnesium. The companionship of calcium and magnesium within the body means, at least in many instances, not a concerted action of similar effects, but rather a resultant effect of antagonistic actions.

Royal Microscopical Society, April 15.—Mr. Conrad Beck, vice-president, in the chair.—Dendritic growths of oxide of copper on paper: J. **Strachan**. The results verified previous investigations, showing that these dendrites originated in minute particles of copper, their branching being due to the direction of the fibres in the paper.—Nature's protection of insect life: F. **Enock**. The slides were taken by the Sanger-Shepherd three-colour process, and Mr. Enock described the method he employed in their production.

Geological Society, April 15.—Dr. J. J. Harris Teall, F.R.S., vice-president, in the chair.—The geological structure of the St. David's area (Pembrokeshire): J. F. N. **Green**. The Cambrian rocks were first traced and found to be faulted greatly. The faults have been followed into the volcanic tuffs (Pebidian), and the succession determined and pieced together. In this way the Pebidian has been subdivided into fourteen horizons, with a total visible thickness of more than 3000 feet. The subdivisions are classified into four series, the lower two of which are composed of trachytic pebbles in a chloritic matrix, and separated by a schistose quartz-felspar-porphry sill. The third series is composed of rhyolite and hälleflinta fragments in a silicified matrix, and the topmost of highly sheared schistose beds. The tuffs appear to be mainly detrital. An unconformity between the Pebidian and the Cambrian is demonstrated. The schistose sill has been traced into the porphyritic margin of the St. David's granophyre (Dimetian), and it is inferred that the granophyre is a laccolitic intrusion in the Pebidian. The boundaries between the granophyre and the Cambrian are prolongations of faults proved in the latter, except at one point in the well-known Porthclais district. A trench opened here exposed basal Cambrian rocks resting upon a denuded surface of the granophyre, which is therefore of pre-Cambrian, but of post-Pebidian age. The relationships of the basic igneous rocks west of St. David's are discussed, and they are all described as post-Cambrian intrusions.—Notes on the geology of Burma: L. V. **Dalton**. The results are given of geological expeditions in the Irawadi Valley, carried out between 1904 and 1906, and present knowledge of the geology of Burma in general and of the Tertiary system in particular is summarised.

Zoological Society, April 28.—Dr. Henry Woodward, F.R.S., vice-president, in the chair.—A revision of the sharks of the family Orectolobidae: C. Tate **Regan**. Twenty-one species were described, and were referred to eight genera. Attention was directed to the great differences in form, coloration, &c., among the members of the family, corresponding to differences in habits and environment.—Identification of an oligochaete worm obtained in considerable numbers from a well near Cambridge, England: F. E. **Beddard**. The author described the worm as a new species of the genus *Phreatothrix*, the only other species of which had been described thirty years ago from the underground waters of Prague.—The amphipod genus *Trischizostoma*: Mrs. E. W. **Sexton**. The memoir was based on a rich material obtained by the steamer of the Marine Biological Association in the Bay of Biscay, and by the steamer of the Irish Department of Agriculture off the west coast of Ireland.—Certain

errors respecting George the Fourth's giraffe: H. **Scherren**. The author adduced evidence to show that the time the animal lived at Windsor had been much understated, and added details as to its life in confinement, the presentation of the skin and skeleton to the museum of the society, and the notes made by R. B. Davis while painting a picture of the animal at Windsor.—Observations on the breeding-habits of a cichlid fish (*Tilapia nilotica*) made in the course of a visit last year to Lake Qurun in the Fayûm province of Egypt: C. L. **Boulenger**.—A revision of the Oriental pelobatid batrachians (genus *Megalophrys*): G. A. **Boulenger**.

Challenger Society, April 29.—Sir John Murray in the chair.—A series of hydrographical sections, illustrating the work of Dr. R. N. Woffenden's yacht *Silver Belle* in 1905 off south-west Ireland and down to Gibraltar: Dr. H. N. **Dickson**. The observations allowed the extension into the Atlantic of the Gibraltar under-current of high temperature and salinity to be carefully re-studied; its effects were observed to reach to 700 or 800 fathoms, where it spreads out as a flat sheet, the high salinity of which gives it a specific gravity equal to that of the colder, fresher Atlantic water. The northward range of this water varies from year to year, and must be taken into account by the International Commission for the Study of the North Sea as a third factor in tracing the sources of Channel and North Sea water.—Practical methods for the collection and investigation of water samples and temperatures: D. J. **Matthews**.

DUBLIN.

Royal Dublin Society, March 24.—Prof. Sydney Young, F.R.S., in the chair.—Reports upon the Irish peat industries (part ii.): Prof. Hugh **Ryan**. The author begins with a description of the methods employed in Ireland for the preparation of peat fuel, and then reviews the attempts which have been made at various times to convert peat into a fuel of greater density than that ordinarily obtained by the Irish farmer. A recommendation is made for the establishing of suitable industries, such as that of glass-manufacture, at carefully selected points of the peat districts having machine-formed turf and peat-moss litter factories in connection with them. The economic importance of "generator gas" and of "mixed power gas" from peat is also considered in the paper, which concludes with a description of the "Woltereck process," employed at Carnlough, co. Antrim, for the preparation of ammonia from peat.

April 14.—Prof. Sydney Young in the chair.—The eruption of Vesuvius, 1906: Dr. H. J. **Johnston Lavis**. The author describes, from information collated and from personal observations a few days after the great outburst, the succession of events at Vesuvius in April, 1906. He points out that these events, and the manifestations since 1872, may be referred to the usual local alteration of "Strombolian" and paroxysmic "Vesuvian" stages of activity. He attributes the great outbursts of volcanic dust, accompanying the crater-forming stage, to the falling in of loose material from the crumbling cone when the lava-column has been drained down to a low level, and to its second ejection by the upbursting steam. In the cone-building stage, on the other hand, the lava-cake on the top of the magma-column, now high up in the vent, is exploded in the form of "essential" scoriæ. The courses of the lava-flows of 1906 are traced out, and their petrography and mineralogy are described. The paper was illustrated by a number of original photographs, including panoramic views showing the ash-deposits and the truncation of the cone.—The radium contents of the rocks of the St. Gothard Tunnel (preliminary note): Prof. J. **Joly**. Estimates of the radium in some typical rocks through which the tunnel was carried show a distribution of radium in accordance with the elevation of temperature which Stapf observed at the northern end of the tunnel and the lesser gradients met with at the south end. So far as the investigation has gone, the average radium content of the rocks of the central and southern sections of the tunnel is considerably below that observed by the author in the case of the Simplon rocks.

Royal Irish Academy, April 13.—Dr. F. A. Tarleton, president, in the chair.—Malignant tumours in birds, with observations on certain changes in the blood: Prof. A. E. **Mettam**. The tumours were round cell sarcomata, seen in the domestic fowl (three cases), and a true carcinoma found replacing the left lung in a thrush (*T. musicus*). Interesting changes were observed in the red blood corpuscles of the thrush. Numerous corpuscles showed profound nuclear degeneration; the nuclei were swollen, approaching the circular in outline, the chromatin network being more distinct. The protoplasm of the corpuscles showed polychromatophilia, and eventually entered into solution. The nuclear substance, now having lost its structure, remains as an irregular lump, staining especially with the acid dyes.—Spirochætes in infective sarcomata of dogs: Prof. A. E. **Mettam**. The author describes certain spirochætes, fusiform and bacillary bodies in smears obtained from the infective sarcomata developed on and in the genital organs of dogs. The number of undulations in the spirochæte is generally five, the length of the organism about 17 μ . The bacillary bodies are long or short, stiff, or, when long and attenuated, slightly undulating. They show metachromatic granules, and may have some relation to the spirochæte which they invariably accompany.—The mouth-parts of some Blattidæ, including a detailed account of the mandibles and maxillæ of *Periplaneta australasiae*, compared with those of other species of the family: J. **Mangan**. The author shows the presence of a distinct lacinia mobilis in the mandible, and gives a full description of the musculature, both of mandibles and maxillæ. He discusses the various views that have been proposed as to the homologies of the parts of a maxilla, and controverts Verhoeff's recent suggestion that the hexapodan maxillæ are primitively posterior to the labium.

April 27.—Dr. F. A. Tarleton, president, in the chair.—A new Devonian isopod from Kiltorcan, co. Kilkenny: Prof. G. H. **Carpenter** and I. **Swain**. The fossil, named *Oxyuropoda ligioides*, bears a general resemblance to an oniscoid. The first thoracic segment is closely united with the head, and appears to carry chelate limbs; the uropods are lateral, elongate, acuminate, and unjointed. This forms an interesting addition to the few Palæozoic isopods hitherto known.

PARIS.

Academy of Sciences, May 4.—M. H. Becquerel in the chair.—Formulæ relating to the minima of classes of binary, positive quadratic forms: G. **Humbert**.—The discovery of the law of falling bodies: Pierre **Duhem**. The fact that the velocity of a freely falling body increased in velocity proportionally to the time of fall was well known to Leonardo da Vinci, but it is not stated in his manuscripts whether this was his own discovery, or whether he had derived it from earlier sources. A clear definition of uniformly varying motion was given by Albert de Saxe in 1351, but his view as to the law of a falling body appears to have been erroneous, and it would seem probable that the real law was discovered by da Vinci.—Canonical hyperelliptic functions of the second species: Z. **Krygowski**.—The application of the laws of similitude to the propagation of deflagrations: M. **Jouguet**.—The comparison of continuous current series and shunt dynamos from the point of view of rapidity of starting: Paul **Girault**. Series winding gives the more rapid starting.—A new radiographic method capable of deciding whether a supposed still-born child has really lived or not: Charles **Vaillant**. With infants which have not lived no organ is visible on the radiograph. With infants which have taken a few breaths the stomach alone is visible. When the stomach is more transparent and the intestine becomes visible, the child has lived from one to fourteen hours. In the case of infants who have lived some days without food, the abdominal organs, the lungs, and the liver show on the radiograph. With infants fed during several days all the organs are clearer, and the mass of gas in the intestine allows of a much clearer image of the intestinal mass.—The ultra-violet spark spectrum of dysprosium, and on some remarkable magnetic properties of this element: G. **Urbain**. A catalogue of the spectrum lines of this element for wave-lengths between 2872 and 4221 is given. The coefficient of magnetisation of dysprosium oxide was

determined by means of the Curie and Chéneveau magnetic balance; the oxide was found to be about 12.8 times more magnetic than the oxide of iron, Fe_2O_3 .—The removal of certain soluble substances from solution by precipitates: Paul **Frion**. It has been shown by Jean Perrin that contact electrification plays an important part in certain physicochemical phenomena, and he has applied this to the case of colloidal solutions. The author shows that similar considerations are capable of explaining the removal of soluble salts from solutions by precipitates.—The variation of the electromotive force of liquid chains by the polarisation of interposed diaphragms: Pierre **Girard**. The modifications in the voltage of liquid couples caused by diaphragms or membranes do not appear to be due to the variation of the mobility of the ions in the interposed medium. They appear rather to be due to phenomena of contact electrification.—The synthesis of ammonia and hydrocyanic acid: Herman C. **Wolterreck**. By the passage of air through a Dowson generator charged with wood carbon, considerable quantities of ammonia and hydrocyanic acid appear to be produced. If a mixture of air and ammonia is passed over the heated carbon (at a temperature of about 1100°C .) the yield of hydrocyanic acid is increased, and the amount of ammonia found exceeds that introduced with the air.—The estimation of the halogens in organic chloro-bromo-compounds: H. **Baubigny**. The method of combustion with sulphuric and chromic acids has been modified for the analysis of organic compounds containing both chlorine and bromine. Test analyses are given showing the exactness of the method.—A new method for the preparation of homologues of naphthalene: G. **Darzens** and H. **Ront**. An acyl derivative of naphthalene is prepared by Friedel and Crafts's method, and this reduced by hydrogen in presence of reduced nickel. The yields are quantitative, and the addition of hydrogen to the ring has not been observed.—The action of phenylmagnesium bromide upon the second methyl ester of paradiethylamido-orthobenzoylbenzoic acid: J. **Pérard**.—The formation of the cyanohydrin of benzoylacrylic acid: J. **Bougault**. The addition appears to be made at the ethylene linking, the acid formed being $\text{C}_6\text{H}_5\cdot\text{CO}\cdot\text{CH}_2\cdot\text{CH}(\text{CN})\cdot\text{CO}_2\text{H}$.—The anatomy and development of the embryo in palms, the Musaceæ, and Cannaceæ: C. L. **Gatin**.—The ecological characters of the southern region of Kabylie du Djurdjura: G. **Lapie**.—Simple schizogony in *Amoeba blattae*: L. **Mercier**.—The geology of the north and east of Corsica: E. **Maury**.—The migration towards the north of the watershed in the Lepontine Alps: Gabriel **Eisenmenger**.—The application of wireless telegraphy to weather forecasts: Alfred **Angot** (see p. 34).

DIARY OF SOCIETIES.

THURSDAY, MAY 14.

ROYAL SOCIETY, at 4.30.—Croonian Lecture: The Structure of the Central Nervous System of the Higher and Lower Animals: Prof. Gustaf Reizius, For. Mem. R.S.

ROYAL INSTITUTION, at 3.—Mendelian Heredity: W. Bateson, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—On the Invariants of the General Linear Homographic Transformation in Two Variables: Major P. A. MacMahon.—On the Order of the Group of Isomorphisms of an Abelian Group: H. Hilton.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Switch Gear Control Apparatus and Relays for Alternating-current Circuits: Dr. C. C. Garrard.

IRON AND STEEL INSTITUTE, at 10.30 a.m.—On Improvements in Plate Rolling Mills: A. Lamberton.—On the Physical Qualities of Steel in Relation to its Mechanical Treatment: J. E. York.—On a New Fatigue Test for Iron and Steel: Dr. T. E. Stanton.—On an Experimental Electric Furnace for the Smelting of Iron: Prof. B. Igewsky.

FRIDAY, MAY 15.

ROYAL INSTITUTION, at 9.—The Past and Future of Tuberculosis: H. T. Bulstrode.

IRON AND STEEL INSTITUTE, at 10.30 a.m.—On Cast Iron in the Construction of Chemical Plant: F. J. R. Carulla.—On the Application of Colour Photography to Metallography: E. F. Law.—On the Utilisation of Blast-Furnace Slag for Portland Cement: C. von Schwarz.—On the Department of Metallurgical Chemistry in the National Physical Laboratory: W. Rosenhain.—On the Pyrometric Installation of the Ordnance Factories, Woolwich: J. Wesley Lambert.

ROYAL SOCIETY OF ARTS, at 8.—The Dangers of Coal Dust and their Prevention: W. E. Garforth.

MONDAY, MAY 18.

VICTORIA INSTITUTE, at 4.30.—On the Evidence of Malay, Javanese, Arabian and Persian Admixture in the Inca or Keshina Language of Peru, amongst the Aymara, the Language of the Peasant Class: F. W. Christian.

TUESDAY, MAY 19.

ROYAL INSTITUTION, at 3.—Light: What it is which Vibrates: Prof. F. T. Trouton, F.R.S.

ROYAL STATISTICAL SOCIETY, at 5.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—The Pagan Gwari of Northern Nigeria: L. W. la Chard.

WEDNESDAY, MAY 20.

ROYAL SOCIETY OF ARTS, at 8.—Industrial Entomology: or the Economic Importance of a Study of Insect Life: F. Martin Duncan.

ROYAL METEOROLOGICAL SOCIETY, at 4.30.—Upper Air Observations in Egypt: B. F. E. Keeling.—Balloon Experiments in Barbados, November 6-8, 1907: Prof. J. P. d'Albuquerque.—Observations on the Colour of Lightning, 1903-1907: S. C. Russell.

GEOLOGICAL SOCIETY, at 8.—On some Cretaceous Fish-Remains obtained by Prof. Ednes de Souza from Ilheos, Bahia (Brazil): Dr. A. Smith Woodward, F.R.S.—On the Bala and Llandoverly Rocks of Glyn Ceiriog (North Wales): Dr. T. Groom and P. Lake.

ROYAL MICROSCOPICAL SOCIETY, at 8.

THURSDAY, MAY 21.

ROYAL SOCIETY, at 4.30.—Probable Papers: On Some Features in the Hereditary Transmission of the Albino Character and the Black Piebald Coat in Rats: G. P. Mudge.—A Further Note on the Nutrition of the Early Embryo, with Special Reference to the Chick: E. Emrys-Roberts.—The Antagonistic Action of Calcium upon the Inhibitory Effect of Magnesium: S. J. Meltzer and J. Auer.

ROYAL INSTITUTION, at 3.—The Chemistry of Photography: Dr. Alexander Scott, F.R.S.

ROYAL SOCIETY OF ARTS, at 4.30.—The United Provinces of Agra and Oudh: Sir J. J. D. La Touche, K.C.S.I.

CHEMICAL SOCIETY, at 8.30.—Hydroaromatic Ketones, Preliminary Note: A. W. Crossley and C. Gilling.—Titan-dihydroxymaleic Acid, and the Detection of Titanium: H. J. H. Fenton.—Some Experiments on Carbon at High Temperatures and Pressures, and Apparatus Therefor: R. Threlfall.—The Sulphides and Oxy-sulphides of Silicon: I. G. Rankin and S. M. Revington.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Recent Progress in Tungsten Metallic Filament Lamps: H. Hirst.

INSTITUTION OF MINING AND METALLURGY, at 8.

CONTENTS.

PAGE

A Contribution to the History of Medicine	25
The California Earthquake. By Prof. J. Milne, F.R.S.	27
Electric Railways. By Prof. Gisbert Kapp	27
Our Book Shelf:—	
Mathews: "Algebraic Equations"; Whittaker:	
"The Theory of Optical Instruments."—H. H.	28
Bruce: "Detection of the Common Food Adulterants."—C. S.	28
Ball: "Altitude Tables."—Count de Miremont	29
Castle: "Logarithmic and Other Tables for Schools"	29
"Praise of a Simple Life"	29
Letters to the Editor:—	
On the Radio-activity of Potassium and other Alkali Metals.—Prof. J. C. McLennan	29
Chemical Analysis of Water from Dew Ponds.—Sidney Skinner	30
The Reflection of Distant Lights on the Clouds.—Charles J. P. Cave	30
Jupiter's Eighth Satellite.—Prof. George Forbes, F.R.S.	30
The Corrosion of Iron and Steel.—Dr. J. Newton Friend	31
Fault Lines in the Atlantic.—Dr. Wm. S. Bruce	31
The Pollination of the Olive.—Prof. T. D. A. Cockerell	31
The Coloration of Birds' Eggs.—R. L. Leslie	31
The Cruises of the <i>Valhalla</i> . (Illustrated.) By R. L. Albert de Lapparent	32
By A. G.	33
M. Albert Lancaster	33
Notes.	34
Our Astronomical Column:—	
The D_3 (Helium) Absorption Line in the Normal Solar Spectrum	38
The Light-curve of δ Cephei	38
The Masses of α Carinae and α Pavonis	38
The New Tower Telescope of the Mount Wilson Solar Observatory	38
Further Observations of Jupiter's Eighth Satellite	38
Observations of Perseids in 1907	38
The Extinction of Malta Fever. (Illustrated.) By Colonel David Bruce, C.B., F.R.S.	39
Russian Transliteration. By Prof. J. W. Gregory, F.R.S.	42
Dyeing Qualities of Natural and Synthetic Indigo	43
May Meteors. By W. F. Denning	47
University and Educational Intelligence	43
Societies and Academies.	45
Diary of Societies	48